HETCH HETCHY ROAD
Yosemite National Park
Between Mather and O'Shaughnessy Dam
Mather vicinity
Tuolumne County
California

HAER No. CA-152

~~PHOTOGRAPHS~~

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
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HISTORIC AMERICAN ENGINEERING RECORD

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I. INTRODUCTION

Location:	Between park boundary, approximately 1/2 mile northeast of Mather, and O'Shaughnessy Dam, Hetch Hetchy Valley, Yosemite National Park, Mather vicinity, Tuolumne County, California. UTMs: West end: 1/2 mile NE of Mather Lake Eleanor quadrangle 11/249700/4197500 East end: O'Shaughnessy Dam Hetch Hetchy Reservoir quadrangle 11/255150/4203333 [Note: Location references refer only to sections of road within the park.]
Date of Construction:	1915, 1925
Designer and Builder:	Original wagon road built by area ranchers; reconstructed by the City of San Francisco as railway grade 1910s, converted to motor road in 1925.
Present Owner	Present Owner: Yosemite National Park, National Park Service
Present Use:	Access road to the O'Shaughnessy Dam and the Hetch Hetchy Reservoir.
Significance:	Although the Hetch Hetchy Valley was known even earlier than the Yosemite Valley, no road reached the isolated valley until 1915. The road was built as a roadbed for the construction railway for the O'Shaughnessy Dam, the principal structure of the controversial Hetch Hetchy Reservoir Project. The railway was converted to a park highway in 1925.
Project Information:	Documentation of the Hetch Hetchy Road is part of the Yosemite National Park Roads and Bridges Recording Project, conducted in summer 1991 by the Historic American Engineering Record. Richard H. Quin, Historian, November 1991

This is one in a series of reports prepared for the Yosemite National Park Roads and Bridges Recording Project. HAER No. CA-117, YOSEMITE NATIONAL PARK ROADS AND BRIDGES, contains an overview history of the park roads.

II. HISTORY OF THE HETCH HETCHY ROAD

The Hetch Hetchy Road provides access to the Hetch Hetchy Reservoir in the northwest section of Yosemite National Park. The road roughly follows the route of an early saddle track into the valley. The present park highway was constructed on the grade of a mountain railway which was built in the 1910s to facilitate the construction of the mammoth O'Shaughnessy Dam and the Hetch Hetchy Reservoir.

The picturesque Hetch Hetchy Valley (the name derives from "Hatchatchie," a Central Miwok word for an edible grass gathered there) was discovered by whites even earlier than the Yosemite Valley. In 1850 or soon afterwards, a rough saddle trail was built to provide access to the remote valley.[1] This route ran roughly from the Big Oak Flat Trail at Hardin's Ranch, across the Middle Fork of the Tuolumne River to Hog Ranch (now Mather) and then up the divide between the Middle Fork and the Tuolumne River proper to a small ranch called "the Cañon" before dropping six miles into the valley (now flooded by the Hetch Hetchy Reservoir).

Despite the trail, the valley remained isolated throughout the nineteenth century. In 1890, the Hetch Hetchy area was included in the boundaries of the newly-established Yosemite National Park. The U.S. Cavalry, which administered the park in these years, was unable to fund road improvements in the Hetch Hetchy area, but did use the saddle trail and other trails in and around the Tuolumne canyon for patrol purposes.

In 1899, Secretary of War Russell A. Alger appointed a commission to inspect the road system of Yosemite National Park. In addition to looking into the unpopular toll road system providing access to the Yosemite Valley and the possible acquisition of the abandoned Tioga Road, the commission was charged with investigating a route for a new wagon road into the Hetch Hetchy Valley. The commission filed its report to the Secretary of the Interior on 4 December 1899. It recommended that a 13 1/2-mile route could be constructed from Hodgdon's Ranch at a cost of $52,000.[2] However, no funds were appropriated to construct the proposed road.

The United States Geological Survey surveyed the Hetch Hetchy Valley as a potential reservoir site in 1890. However, the designation of Yosemite National Park that year appeared to have caused the plans to be shelved. However, Hetch Hetchy soon attracted the attention of the City of San Francisco. The City adopted a new charter in 1900, and one of its provisions dictated the municipal ownership of public utilities. An adequate water supply was the chief concern. As early as the 1870s, the city entertained a plan to tunnel beneath the Sierra to pipe water from Lake Tahoe. Nothing came of this, and at the turn of the century, the city was supplied with water from a medley of private utilities. This water came from small streams in the hills surrounding the city and from wells in the Livermore area; however, the rapidly-growing city was taxing these sources to their maximum potential, and much discontent was expressed at the high costs charged by the water companies. The business community began a campaign for a major municipal water supply system.

The city Board of Public Works in 1902 recommended the acquisition of water rights to the Tuolumne River, which rises in Yosemite and is the chief stream in the northern half of the park. The report cited the river's purity, abundant supply, and hydro-electric generating potential. It suggested that a storage reservoir should be located within the park at Hetch Hetchy, this being the best potential dam site. The location of the project within the Yosemite National Park meant that the water was "free from competing claims" of private concerns (although the Modesto and Turlock Irrigation Districts had prior claims on water rights farther downstream);[3] however, federal approval would have to be obtained for the use of public lands.

Claims on the Tuolumne water supply were secured by San Francisco Mayor James B. Phelan, acting as an individual so as not to draw the attention of the competing water companies. This also involved the purchase of a number of inholdings in the Hetch Hetchy Valley and on some of the Tuolumne headwaters. Phelan transferred the rights to the City in 1903 for the proposed "Hetch Hetchy Project."[4] The city began concerted planning for the new reservoir project.

At about the same time, some minor tourist activity was taking place within the Hetch Hetchy Valley. In 1903 and 1904, one Stoddard developed plans for a small resort within the Valley. Charles Baird, who operated a stage line from Hazel Green to Hog Ranch, packed in tents and supplies for the new camp from Groveland. Baird then conveyed passengers by stage to Hog Ranch, from which they had a four-mile trip on saddle to the valley. The trail into the valley was very rough; some passengers had to be lifted off of their animals and walked around upon arrival. Only about one hundred tourists made the trek, and the "resort" closed the next year.[5]

Once the intentions of the City of San Francisco became known, the Hetch Hetchy Project was assailed by several different constituencies. Irrigation farmers on the lower Tuolumne decried the project, and the private water companies attacked the project which would decimate their business. Conservationists soon joined the debate. The boundaries of Yosemite National Park were greatly reduced in 1905, and park supporters totally rejected the idea of the flooding of the Hetch Hetchy Valley, which they described as a "second Yosemite."

The great San Francisco earthquake of 1906 was accompanied by a major fire which destroyed great numbers of city buildings which had survived the shock. Supporters of the Hetch Hetchy Project stated that the fire was not contained because of inadequate supply and pressure, and that the construction of the project should provide a means to better deal with such major fires in the future.[6] Accordingly, the City applied to the United States Department of the Interior to construct a large storage reservoir at Hetch Hetchy Valley in Yosemite National Park.

The project would of course have a considerable impact on the federal lands. Several smaller storage reservoirs and much of the aqueduct would be built on U.S. Forest Service lands. In 1907, Forest Service Chief Gifford Pinchot came out in support for the project.[7] However, the Secretary of the Interior, in whose charge the national parks rested, was collecting data on the project but had not yet given approval for the drowning of the Hetch Hetchy Valley and the smaller Eleanor Creek Valley four miles northwest, where a collateral storage reservoir would be built.

Major Harry C. Benson, Acting Superintendent of the park in 1907, opposed the project and tried to deter the city from conducting surveys in the Hetch Hetchy Valley. Benson urged Secretary Garfield to consider the construction of a wagon road into the Hetch Hetchy Valley. Benson suggested that the valley might prove an alternate destination to the already-crowded Yosemite Valley.

> This valley being one of the most interesting features of the park, should be made easy of access by a wagon road, which could be built at a reasonable cost, say not to exceed $10,000 per mile, and it is believed that such an expenditure would be a wise one, as a beautiful place would be opened to the general public.[8]

Despite the reservations of conservationists and the park administration, Secretary Garfield issued a preliminary permit for the project. The "Garfield Permit" immediately produced a storm of protest against the project. Because of concerns about the magnificent landscape and the project's location Yosemite, the debate soon became a national one. The Sierra Club, with John Muir as its most visible spokesperson, vigorously attacked the project, and was joined by other groups and astounded individuals from across the country. A committee, made up of John Muir, William E. Colby, Joseph LeConte, Jr., William Frederick Badè and Edward Taylor Parsons sought to promote the tourist opportunities the "little Yosemite" had to offer. They called for extended trail construction in the Tuolumne River watershed and a road into Hetch Hetchy Valley. The valley should not be used for a reservoir, but as an alternative destination to the congested Yosemite Valley.[9] But the City of San Francisco persisted with planning for the project, and new surveys began in 1909.

Richard A. Ballinger, who succeeded Garfield as Secretary of the Interior, was skeptical of the city proposal, and in 1910 asked the City to "clarify" its need for the project. The following year, President Howard Taft appointed three army engineers to investigate the project.[10]

In July 1912, the City of San Francisco published a proposed plan for the use of the Hetch Hetchy, Eleanor and Cherry valleys in the northwest portion of the park and in the Stanislaus National Forest Reserve just outside the park. The study was prepared by civil engineer John R. Freeman of Providence, Rhode Island. Freeman outlined a vast project which would call for the construction of three large storage dams, the inundation of three large valleys, construction of an aqueduct to carry water to San Francisco, and a large hydroelectric power plant at Moccasin in Tuolumne County.[11] The study was presented to the Taft commission.

As part of the proposal, Freeman stated that the City would make improvements at the main storage reservoir at the Hetch Hetchy Valley. As part of the project, new access roads would be provided. General specifications for the roads were outlined in the report:

> (2) The City proposes to build a first-class well-surfaced wagon road with frequent turnouts such that teams could pass and upon a gradient nowhere exceeding 8 per cent and commonly much less, into the Hetch Hetchy Valley from the old Yosemite stage road near Smith's Station, a distance of 23 miles approximately; and to forever maintain the same in good order, open to the public save when obstructed by snow or by washouts during the winter months. The quality of roadbed to equal that of the State highways. The

> city also proposes to either improve existing roads, or build new roads so far as may be necessary for obtaining easy grades and good quality of roadbed, westerly from Smith's Station to a point near the crossing of the main Tuolumne River near Moffat Bridge, Jacksonville, doing this improvement of line, grade and surface at the city's expense, but in co-operation with the State or county authorities.[12]

The City reserved rights to lay a railway line along half the width of the roadbed during the construction period for the dam and aqueduct and to construct telephone and electrical power lines to the dam sites. In addition to the right-of-way for the road, the City also stated its desire to take nearby gravel, stone and timber for construction of the road. As justification, the proposal cited "The betterment of transportation for the federal service should be deemed proper compensation for such material taken for road building and for other parts of the construction."

In addition to the main access road, the City also proposed to build a scenic drive around the Hetch Hetchy Valley "as a means for adding to the pleasure of the its citizens, their California neighbors and their friends." The road would make a loop around the reservoir. Title to the roadway and all the land between it and the reservoir was requested for purposes of maintenance. The study described the proposed circuit road:

> (3) The city proposes to build and maintain a scenic road along both shores of the proposed Hetch Hetchy lake. This road to have a surface nowhere less than fifteen feet in width, the grades seldom, of anywhere, exceeding 8 per cent, and with roadbed equal in permanence and surface to the State highways, and also proposes to construct one or more narrower and possibly steeper wagon roads branching from this circuit road into the Till Till Valley or other point of scenic interest; also to construct and maintain a good bridle path from near the dam to the top of Smith's Peak.[13]

The report was provided with a series of doctored photographs, in which the proposed loop road was drawn in, complete with bridges and other structures. Some of the photographs superimposed existing roads on Norwegian fjords with Hetch Hetchy landmarks, such as Wapama Falls and Kolana Rock. Ballinger's successor as Secretary of the Interior, Walter A. Fisher, was unwilling to respond to the report and stated that action of Congress would be required to resolve the issue.[14]

A bill to authorize the project was placed before Congress and passed, and was signed into law by President Wilson on 19 December 1913. The "Raker Act" authorized the City of San Francisco to construct a dam across the Tuolumne River at Hetch Hetchy and to divert the water for domestic use, while at the same time generating electricity from a collateral power plant.[15] Conservationists were of course dismayed, and the impoundment of the Hetch Hetchy Valley is considered today the greatest loss of a significant landscape in the national park system.[16]

In the meantime, cattlemen and others living in the area constructed an improved rough wagon road leading from the Tioga Road near Carl Inn through Ackerson Meadow and on to Hog Ranch. A bridge was constructed over the Middle Fork of the Tuolumne River in 1915.[17] However, access to the Hetch Hetchy Valley remained difficult.

The City of San Francisco in 1913 offered to spend one million dollars on the construction of roads and trails as a part of its investment in the project. The Raker Act, which gave the city rights-of-way through the park and the adjoining Stanislaus National Forest, dictated that a scenic road would be constructed along the north side of the reservoir, and that an access road be constructed along the aqueduct from Hamilton (Buck Meadow) to Hog Ranch and on to the dam site. Another road was to be built from Hog Ranch *via* Harden Lake to the Tioga Road. These roads would allow for access to parts of the park which would otherwise be cut off when the reservoir flooded existing trails from the Valley into the north end of the park. The roads were to be assigned to the federal government, but the city was to retain responsibility for their maintenance.[18]

The City considered two alternatives to ship equipment and supplies to the dam site. One was a motor road suitable for the transport of heavy loads, and the other was for a temporary construction railway. The City determined that the railway would offer a lower cost per ton-mile hauled, and would also generate revenues from hauling passengers and especially lumber; it therefore adopted the latter alternative. The new railway line would utilize trackage rights over the Sierra Railway to a point 15 miles west of Jamestown. Here, a new spur line would deviate to the Hetch Hetchy Valley. The tracks would follow the Tuolumne River from Red Mountain Bar to Jacksonville, then cross the divide to Moccasin Creek before climbing Priest's Hill to reach Groveland. From Groveland, the railway would follow the ridge through Hog Ranch and on to the Hetch Hetchy Valley. Part of the route would use old trackage of the Hetch Hetchy and Yosemite Valley logging railway.[19] The upper section of the railway above Hog Ranch was to be removed following the construction of the dam.

The Utah Construction Company received the contract to grade and prepare a 9-mile road from Hog Ranch to the Hetch Hetchy Valley late 1914. The road specifications called for a 22' wide roadway, suitable for conversion to a railway bed, and wide enough for a later park highway, as specified in the Raker Act. The engineers simultaneously prepared plans for the railway. Construction of the "Hetch Hetchy Rail Road" began in February 1916 under the supervision of engineer W. H. Newhall.[20]

East of Groveland, the connecting Big Oak Flat Road sections outside the park was rebuilt with a maximum grade of 6 percent, as opposed to over 20 percent on the old road. Some of the work, including the replacement of the covered bridge over the Middle Fork of the Tuolumne River with a new open deck structure, was done by Tuolumne County, which had recently purchased the old toll road. The remaining improvement work was done by City of San Francisco personnel. From "Hetch Hetchy Junction," the wye on the Sierra Railway, the major part of the new 68-mile railway was contracted to Frederick Rolandi, former engineer for the Milwaukee, St. Paul & Pacific Railroad and for street railways in San Francisco and Shanghai. This section would run from Hetch Hetchy Junction to Hog Ranch (renamed "Mather" at about this time after Stephen T. Mather, first Director of the National Park Service), from which point to the valley the grade was to be prepared under the Utah Construction Company contract. Construction of the rail line proper began at the junction in February 1916.[21]

Northeast of Mather, the railway line entered Yosemite National Park on the new road bed. The high point on the line, elevation 5,064', was reached at Poopenaut Pass within the park. The final 4 miles to the dam site was constructed on a steady 4 percent descent grade. All track was laid by the

end of October 1917, though ballasting continued for another year. Total cost of the entire railway line was about $2 million; however, construction costs only amounted to about $25,000 per mile, despite the rough terrain.[22]

A rough 12-mile truck road was also constructed from Hetch Hetchy northwest to Lake Eleanor in 1916 and 1917.[23] The road crossed the river on a modified Warren through-truss bridge until the reservoir was completed, and then was carried across the main dam.[24] The road was built for the construction of the smaller, multiple-arch Eleanor dam. This tote road has since been maintained only as a trail to provide access to the Lake Eleanor dam and a backcountry ranger station. (A controlled-access road from the Stanislaus National Forest provides access to this dam from the west, and to the larger Cherry Lake dam in the national forest.)

Construction of the O'Shaughnessy Dam began in 1915.[25] The construction road into the Hetch Hetchy Valley was used for the clearing of the reservoir site. Much of the material used in its construction was hauled over the rail line. Trees were floated down towards the dam site, where they were hauled out and carried to a sawmill below Mather, where they were cut up for lumber for the construction project. The railway was also extended up the valley as far as Rancheria Creek, where most of the gravel for the concrete was obtained. The placing of concrete began in September 1921 and continued for two years. The dam was completed in the spring of 1923; at the time, it was the second highest dam in the United States, only 10' lower the Arrowrock Dam in Idaho. The dam was dedicated on 7 July 1923. The aqueduct and penstocks carrying the river from the intake (west of the park) to Moccasin were complete by June 1923, and power production began in August. The main aqueduct was completed and water from the Hetch Hetchy Reservoir reached San Francisco in October 1934.[26]

The Hetch Hetchy Rail Road was used mainly for hauling construction materials and supplies for the massive O'Shaughnessy Dam. However, a number of automobiles and trucks, adapted for use over the rails, were used in the line. Some rail cars carried tourists in to view the project; campers were hauled in on open flat cars.[27]

The City of San Francisco removed the Hetch Hetchy Railroad in 1925 and resurfaced the roadbed between Mather and Hetch Hetchy to make it available for automobile traffic. The work was done in the summer and early fall, and the road was opened on 19 September 1925. Two years later, the Park Service erected an entrance gate at the road at the park boundary.[28] Completion of the road made the Hetch Hetchy area far more accessible, and the controversial O'Shaughnessy Dam became another Yosemite attraction.

During the late 1920s, the Hetch Hetchy Reservoir was advertised by the Yosemite Transportation System (which now ran auto stages) as an attraction on the "Bret Harte Line, Route of Romance," after the author who had written numerous stories about Tuolumne County. From South Fork (on the Tuolumne River), the route visited Hetch Hetchy, then went by Carl Inn to the Tuolumne Big Tree Grove and Crane Flat before making the descent to Yosemite Valley.[29]

One of the provisions of the 1913 Raker Act was a requirement that the City of San Francisco spend $1.5 million on the construction of roads and trails in the area around the reservoir. Despite protests from the National Park Service, the city proved very slow to comply with this provision, and when the Hetch Hetchy Rail Road was removed in 1925 and the city began to construct some of the roads, the Park Service found the work unsatisfactory. The City

insisted that it was only obligated to build roads to meet the 1913 standards in effect when the bill was passed.[30] Other than the main road along the old railbed and the rough service road to Lake Eleanor, no other roads were built.

The Hetch Hetchy Road was extensively repaired from Mather to Hetch Hetchy in 1931. The work being done under a City of San Francisco contract. Specifications for the 9.1-mile project called for repairs to the full 22' roadway, rebuilding of weak shoulder sections, and the construction of cement rubble masonry retaining walls and guard walls along the road. A crushed rock base would be applied to the road, which would then be sprayed with a surface treatment of fuel oil and asphaltic oil.[31] This, of course, resulted in poor-quality surfacing. Such low-quality work by the City of San Francisco was a continuing irritation to park administration.

The retaining walls and guard walls, were, however, of excellent construction. Native granite, carefully chosen for color or lichen coverage, was used in their construction. The walls were laid with a minimum batter of 1:3, and were fully bedded in portland cement. A minimum of one out five stones used was a header stone extending through the wall. Drainage openings were left between occasional stones where necessary. The guard walls were 2'6" high, with a 6" x 6" wheel guard stone laid on the inside of the roadway. The walls are built on the same 1:3 minimum batter and are 1'6" wide at the top.[32] These walls survive and serve well, channelling traffic along the winding road while leaving the view of the valley unobstructed.

In 1933, plans were made to raise the O'Shaughnessy Dam by 25 percent to 430' in order to provide for additional storage capacity and hydroelectric potential. Work on the project began in 1936. Supplies were carried over the Hetch Hetchy Railroad and the Sierra Railway (after 1937, Sierra Railroad) as far as Hog Ranch.[33] Supplies were then hauled over the park highway from Hog Ranch to the dam site. Over the course of the construction the Hetch Hetchy Road was severely damaged by heavy construction vehicles. The initial patching work proved of poor quality, resulting in a rough road. As a result, an armor coat pavement was applied to the road.[34]

The section of road between Mather and Hetch Hetchy was resurfaced with a bituminous asphalt treatment in the fall of 1937. The loop at the northeast end of the road and a parking area at the south side of the dam were constructed in January 1938. This work followed the removal of the last construction equipment from the dam. Both of these projects having been previously contracted, this work was done by the City of San Francisco;[35] NPS landscape architect John B. Wosky reviewed the landscaping design and implementation for the project. The surfacing work was contracted to the Transbay Construction Company and the American Bitumils Company. First, a base course was prepared using approximately five hundred tons of crushed rock, bound with emulsified asphalt. Next, a seal coat was applied to the entire road. This 1/8" to 1/4" quick-setting emulsified asphalt coat was followed with a layer of screened rock. Approximately one thousand tons of rock was used and 150 tons of bitumils. The ditches were cleaned after resurfacing and a center line stripe was painted on the new road.[36]

The City still maintained that it was only obligated to provide roads built to 1913 standards in the Hetch Hetchy region. By this point, however, the National Park Service had decided it did not want roads in the area anyway. To avoid the construction of an inadequate road and trail network in this fairly remote section of the park, an agreement was reached in August 1932 between the city and the Park Service under which the NPS would take

responsibility for road and trail construction in return for $1.25 million of city money. The funds could be used for the construction of other roads in the park. After considerable debate, much of this money was for the reconstruction of the Tioga Road eastward from Crane Flat.[37]

In the 1950s, the "Big Oak Flat Recreational Highway Association" proposed a new spur road leaving California Highway 120 (the section of the Big Oak Flat Road outside the park) at "Cliff House" and passing via Mather to Hetch Hetchy.[38] This road was not built, and the Hetch Hetchy Road today follows the same general route as that of the construction railway between Mather and the valley. Another road was proposed to connect Hetch Hetchy with Harden Lake, but this route, too, was never constructed.

Regular maintenance was applied to the Hetch Hetchy Road. In 1956, Acting Park Superintendent Keith Nelson again pressed the City of San Francisco for funds to repair the road. He offered to use Park Service crews to do the work on a reimbursable basis.[39] A work crew was assigned to the work on the road in April 1958, and established a construction camp at Hetch Hetchy. Six men, with a motor grader, skip loader, two dump trucks and an oiler, blasted additional rock from road margins, removed 233 cubic yards of rock from ditches, and felled hazard trees. The rock that was removed was used to build up washed-out shoulders along the road.[40]

In 1971, plans were made to resurface the Hetch Hetchy Road with hot bituminous pavement laid over an emulsified asphalt tack coat. The National Park Service asked the City of San Francisco for partial funding under the provisions of the Raker Act.[41]

In 1987, Secretary of the Interior Donald Hodell shocked San Franciscans and California agricultural interests by suggesting that the O'Shaughnessy Dam be dismantled and the Hetch Hetchy Reservoir drained, in order to allow the drowned valley to revert to its natural condition. He argued that the restored valley would become a major attraction and relieve some of the overcrowding in the Yosemite Valley. But the proposal was quickly dismissed, and the Hetch Hetchy Valley remains submerged.[42]

The Hetch Hetchy Reservoir is today a popular destination point for Yosemite tourists. The road also provides access to a number of trails in the northern part of Yosemite National Park. Although the floor of the Hetch Hetchy Valley is inundated, the place remains one of spectacular beauty.

III. ENDNOTES

1. Information provided by Yosemite National Park Historian James B. Snyder.

2. *Report of the Commission on Roads in Yosemite National Park, California* (Washington, D.C.: U.S.Senate Document #155, 56th Congress 1st Session, 1899), 1, 15; Linda Wedel Greene, *Yosemite, The Park and Its Resources: A History of the Discovery, Management, and Physical Development of Yosemite National Park, California*, 3 vols. (Washington, D.C.: National Park Service, 1987), I:344.

3. Ted Wurm, *Hetch Hetchy and its Dam Railroad: The Story of the Uniquely Equipped Railroad that Serviced the Camps, Dams, Tunnels and Penstocks of the 20-Year Construction Project to Bring Water from the Sierra to San Francisco* (Berkeley, CA: Howell-North Books, 1973), 17.

4. *Ibid.*.

5. *Ibid.*, 18.

6. *Ibid.*, 19.

7. Michael P. Cohen, *The History of the Sierra Club*, 1892-1970. (San Francisco: Sierra Club Books, 1988), 22-24.

8. Harry C. Benson, *Report of the Acting Superintendent of the Yosemite National Park to the Secretary of the Interior*, 1907, (Washington: Government Printing Office, 1907), 9-10.

9. Cohen, 22-26.

10. *Ibid.*, 21-22.

11. John R. Freeman, *On the Proposed Use of a Portion of the Hetch Hetchy, Eleanor and Cherry Valleys Within and Near to the Boundaries of the Stanislaus U.S. National Forest Reserve and the Yosemite National Park as Reservoirs for Impounding Tuolumne River Flood Waters and Appurtenant Works for the Water Supply of San Francisco, California, and Neighboring Cities* (San Francisco: Board of Supervisors, 1912), 4-14.

12. *Ibid.*, 14. Note that the specifications were for a *wagon* road. San Francisco later maintained that it had only obligated itself to build to these road standards, rather than provide modern roads suitable for automobile traffic. Automobiles were reintroduced into the park only a year later.

13. *Ibid.*, 15.

14. Wurm, 25.

15. Francis P. Farquhar, *History of the Sierra Nevada* (reprint, Berkeley, CA: University of California Press, 1965), 240-41.

16. People in Yosemite like to point out that John Muir died soon after passage of the Raker Act, as if the defeat caused his death.

17. Greene, I:431.

18. *Ibid.*, I:432.

19. Wurm, 41, 47.

20. *Ibid.*, 47-48, 53.

21. *Ibid.*, 45, 53.

22. *Ibid.*, 60-61.

23. Greene, I:508.

24. See the photo of the bridge in the Yosemite Research Library.

25. The dam was named for Michael Maurice O'Shaughnessy, chief engineer of the Hetch Hetchy Project.

26. Wurm, 88, 187, 235.

27. *Ibid.*, 64-65, 155.

28. Greene, II:551, 584. Photographs in the Yosemite Research Library show that the original entry had a rustic-style wooden entrance, with a sign placard for the park spanning the road. A later, surviving boundary marker from the 1920s has "Yosemite National Park" and "Stanislaus National Forest" spelled out in reflective beads.

29. Yosemite Transportation System, "Bret Harte Line" advertisement, n.d., Yosemite Research Library.

30. Robert C. Pavlik, "In Harmony with the Landscape: Yosemite's Built Environment, 1913-1940, *California History* LXIX (Summer 1990), 192; Horace M. Albright with Robert Cahn, *The Birth of the National Park Service: The Founding Years*, 1913-33 (Salt Lake City, UT: Howe Brothers, 1985, 220, 268.

31. Charles G. Thomson, Superintendent's Monthly Report, April 1931, 5.

32. See specifications in City of San Francisco, Hetch Hetchy Water Supply Contract #124, "Grading and Surfacing of the Mather-Hetch Hetchy Road," 1931, 56-58. Copy in Yosemite Research Library.

33. Wurm 251, 254.

34. Thomson to Frank A. Kittredge, NPS Chief Engineer, 11 November 1935, 1; Park Engineer to Thomson, 22 May 1936. Hetch Hetchy Road file, Yosemite National Park Maintenance and Engineering Office.

35. John B. Wosky, Acting Superintendent's Monthly Report, November 1937, 5; Lawrence C. Merriam, Superintendent's Monthly Report, January 1938, 7.

36. Wosky, Memo, 1 August 1937, in Lake Eleanor file.

37. Albright, 269; Pavlik, 192; Thomson, Superintendent's Monthly Report, August 1932, 16.

38. T. J. McCabe, "O'Shaughnessy Dam a Spectacular Scenic Drive," *Oakland Tribune*, 28 August 1938.

39. Keith Nelson, Acting Superintendent, Yosemite National Park, to H. E. Lloyd, City of San Francisco, 23 November 1956, in "Lake Eleanor Road, Photographs of Hetch Hetchy Road and Correspondence" file, Yosemite National Park Maintenance and Engineering Office.

40. William A. Stevenson, Road Superintendent, to M. J. Lyons, Moccasin Creek, California, Memorandum, July 1958. "Lake Eleanor file."

41. Miscellaneous files, "Lake Eleanor" file.

42. Alfred Runte, *Yosemite: The Embattled Wilderness* (Lincoln: University of Nebraska Press, 1990), 201-202, 217.

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